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ONE HUNDRED YEARS
OF THE MISSOURI
BOTANICAL GARDEN^{1,2}

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ABSTRACT

In the hundred years since the Board of Trustees of the Missouri Botanical Garden implemented the stipulations of Henry Shaw's will, which prescribed functions for his public garden and provided an appropriate endowment, six directors have guided the Garden's development. Henry Shaw's (1800–1889) vision of the Garden was based upon his British background and the European botanical garden tradition. William Trelease, the first director (from 1889 to 1912), set his highest priorities on building the herbarium and library and publishing substantial annual volumes, which he believed would make the Garden a major center for taxonomic research. George T. Moore, director for 40 years (from 1912 to 1953), moved the research into other areas of botany, applied botany, and horticulture. Keen on public display yet facing decreasing finances toward the latter part of his tenure, he began to seek private support for various programs, including a new arboretum located outside the city. The short duration of Edgar Anderson's directorship (1954–1957) was focused on Garden improvements with further attempts to raise funds and find support among garden clubs. Frits Went, the fourth director (1958–1963), saw the Garden as a potential multifaceted cultural center for St. Louis. The geodesic domed greenhouse, named the Climatron, opened in 1960 as a major implement in concentrating local and national attention on the Garden. The fifth director, David Gates (1965–1971), moved the Garden into ecological research and found support for a new research building that had been sought by Went. The current director, Peter H. Raven (1971 to the present), has moved the Garden along on various fronts. He has expanded its horticultural displays and special gardens, widened the base of public support, enhanced the research in systematic botany, and projected the role of the Garden into international efforts to understand our biosphere and protect it. Each director has guided the Missouri Botanical Garden in certain directions during the last hundred years to make it the major botanical garden that it now is.

Thinking sentimentally back to his youth at the Mill Hill School in England, Henry Shaw, then in his seventies, sat in Tower Grove House looking out over his St. Louis Public Botanical Garden and wrote:

“Peter Collinson . . . had a house and garden at Mill Hill . . . ten miles from London, and was one of the chief encouragers of gardening and planting in his time Collinson died in 1768 at the age of 74 years, and some time after his death the house and grounds were purchased by the Protestant Dissenters Associa-

¹ This and the five articles that follow it are the proceedings of the 36th Annual Systematics Symposium of the Missouri Botanical Garden, *A Century of Botany: 1889–1989*. The symposium was held 6–7 October 1989 at the Missouri Botanical Garden in St. Louis, Missouri, U.S.A.

² The staff of the library and archives of the Missouri Botanical Garden are gratefully acknowledged for unfailing assistance and hospitality. The use of the archives and special collections of the Royal Botanic Gardens, Kew, the Gray-Arnold Arboretum and Farlow libraries of Harvard University, and Cornell University Library are gratefully acknowledged.

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tion for a school for classics and mathematics Collinson's large Green-house had been altered into a classroom, at one end of which the window still remained, looking from his library into the Green-house below. In 1812 many fine specimens of rare plants still grew in the garden, with the Cypress of Linnaeus; but the most admired trees were the noble Cedars of Lebanon that grew near the play ground, protected from injury by a high board fence. Nearby were the boys' little gardens of about 25 feet square each, well fenced to guard against the intrusions of the football; for those that preferred gardening for a recreation, of which number was—The writer of this Guide—who from 1812 to 1815 thus relieved fugging [sic] at Latin Greek and Euclid, by growing pinks and geraniums, and retiring to a seat in a corner of his little domain, shaded by a broad trained Irish yew, purchased from a neighboring nursery at the price of ten shillings. . . . The writer's studies at Mill Hill, endeared by many pleasing recollections, ended the day that the Great Napoleon's ambitious career closed, by the memorable battle of Waterloo, in June 1815, and returning home to Sheffield in the Great Northern Mail coach, drawn by four spanking grays, bedecked with greens and ribbons that carried the glorious news of victory to the joyful people of Scotland and North Britain."⁴

The wealthy bachelor Shaw (Fig. 1) had worked for more than 40 years before his death in 1889 to perfect his gift of a garden for the people of St. Louis, Missouri, and the nation.⁵ Perhaps he thought about Peter Collinson's garden, which he knew was mostly lost to posterity. After retirement from his active hardware and dry goods business in 1839, Shaw invested his funds in sound St. Louis real estate and other business ventures, which increased his wealth.⁶ Between 1840 and 1852 he made three extensive European trips, which included visiting gardens in different countries. In time, he settled upon making a botanical garden, rather than a pleasure garden, on part of his country land in St. Louis.

Botanical gardens have a long and noble tradition dating from Renaissance times.⁷ Their early particular function was to cultivate plants with medicinal uses and those that served as living texts for learning about materia medica. Thus, they were mostly connected with university medical schools or apothecary guilds. The earliest botanical gardens at Padua and Leyden were laid out in the form of four large beds making a cross pattern with their major paths. The cross is significant not only for its religious connotations, but also because it divided the garden into the four great world divisions then known: Europe, Asia, Africa, and the Amer-

icas. Here then was the world encompassed; God's munificence to humans from all corners of the globe displayed (Fig. 2).

In time, it became evident that not all plants did well under the same conditions. Later botanical gardens, such as the Jardin Du Roi in Paris, had varying habitats, some wet, dry, sunny, and shaded. In fact, it was what we call today an ecological approach to plant cultivation which by this time included all sorts of plants, not only medicinal ones (Fig. 3). By the eighteenth century, learning about God's creation was a worthy endeavor in itself, one that could only magnify the deity.⁸

When Henry Shaw traveled in Europe, there were numerous botanical gardens that served as models. Not surprisingly, his British background led him in 1854 to contact Sir William Jackson Hooker, the director of the Royal Botanic Gardens, Kew.⁹ In time, Shaw emulated some aspects of Kew, for example, by building a museum building, and plant houses, and later an orangery—the Linnean House—based upon Kew models. However, as he wrote to Hooker, he did not have in mind the extensive size and broad activities of Kew, but rather a garden of more modest dimensions such as those of Glasgow or Liverpool.¹⁰ Hooker put Shaw in contact with Asa Gray at Cambridge and George Engelmann at St. Louis. They gave him advice and encouragement.¹¹

On a European trip in 1857 Engelmann purchased the herbarium of some 40,000 specimens from the estate of the recently deceased Johann Jacob Bernhardt, and found botanical books for Shaw.¹² These botanical resources, later including the herbarium and library of Engelmann after his death, were dutifully kept, but little used, in the Museum Building (Fig. 4), which then displayed stuffed animals and oil portraits of important botanists.¹³ These portraits can now be seen on the Garden's library walls.

Shaw concentrated his efforts on the horticultural aspects of the garden. With the aid of his Kew-trained gardener James Gurney, he planted outdoor beds of ornamentals, a fructicetum of shrubs and fruit trees, and an arboretum of trees. The plan was to divide the garden into the three great groups of plants; herbs, shrubs, and trees. In addition, plants needing protection were housed under glass (Fig. 5). By the time of his death in 1889, Henry Shaw had established a considerable public

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FIGURE 1. Henry Shaw at about age 87, from an oil painting at the Missouri Botanical Garden, painted by Fairchild and Fox.



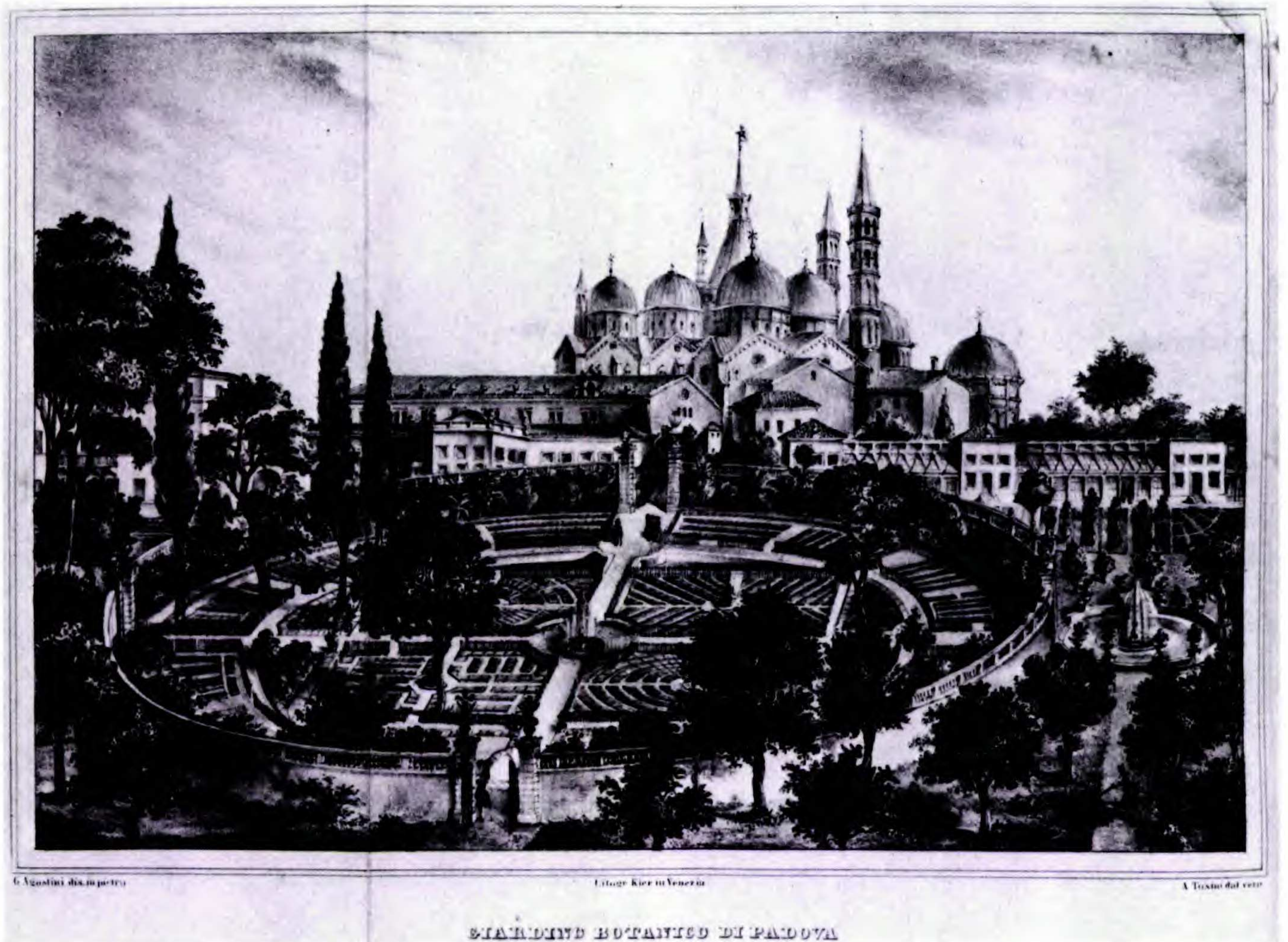


FIGURE 2. Plan of the botanical garden at Padua, from R. de Visiani, *L'Orto botanico dei Padova nell'anno MDCCCXLII*, Padua, Angelo Sicca, 1842. (Courtesy of Hunt Institute for Botanical Documentation, Carnegie Mellon University, Pittsburgh, Pennsylvania.)

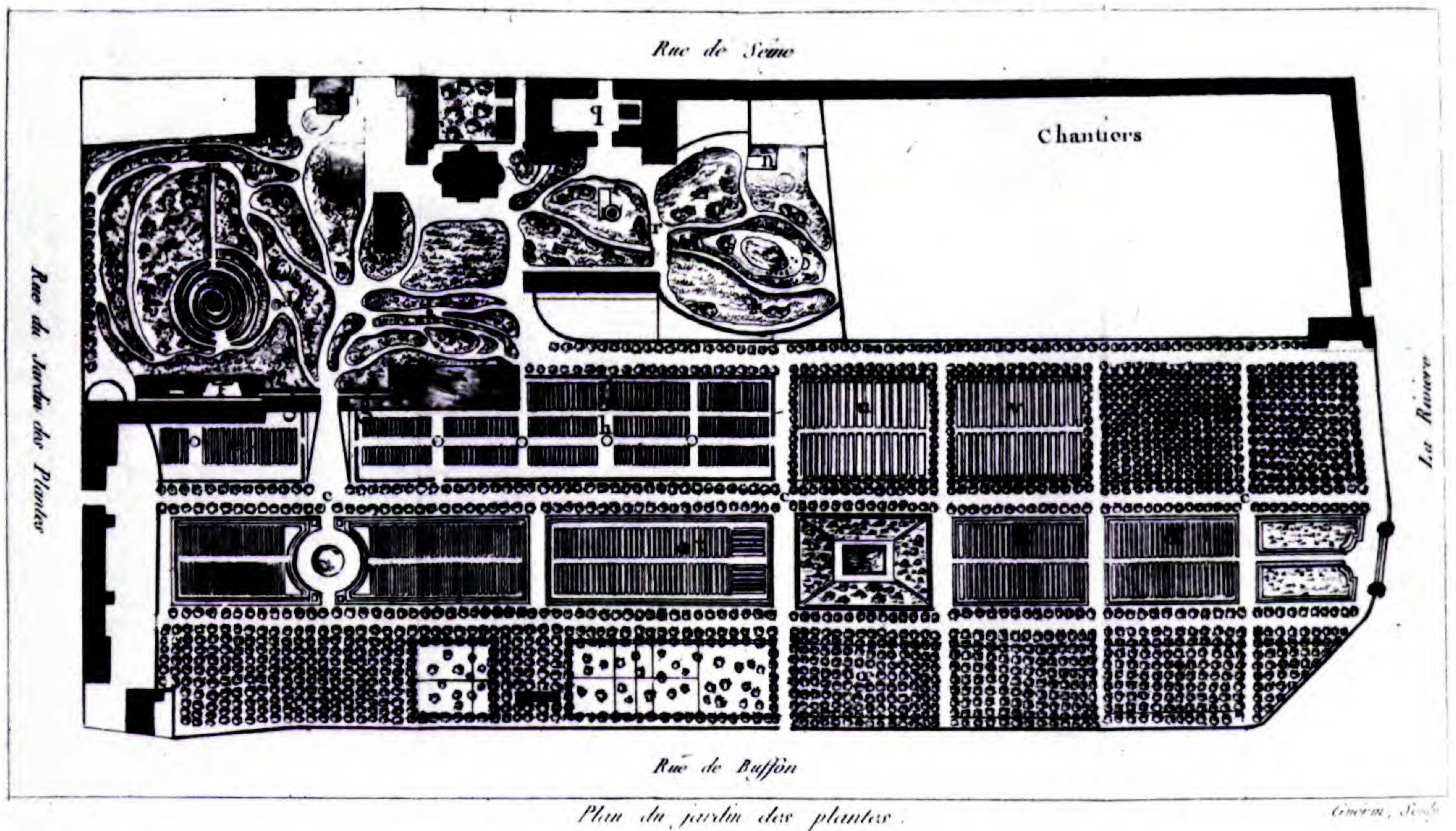
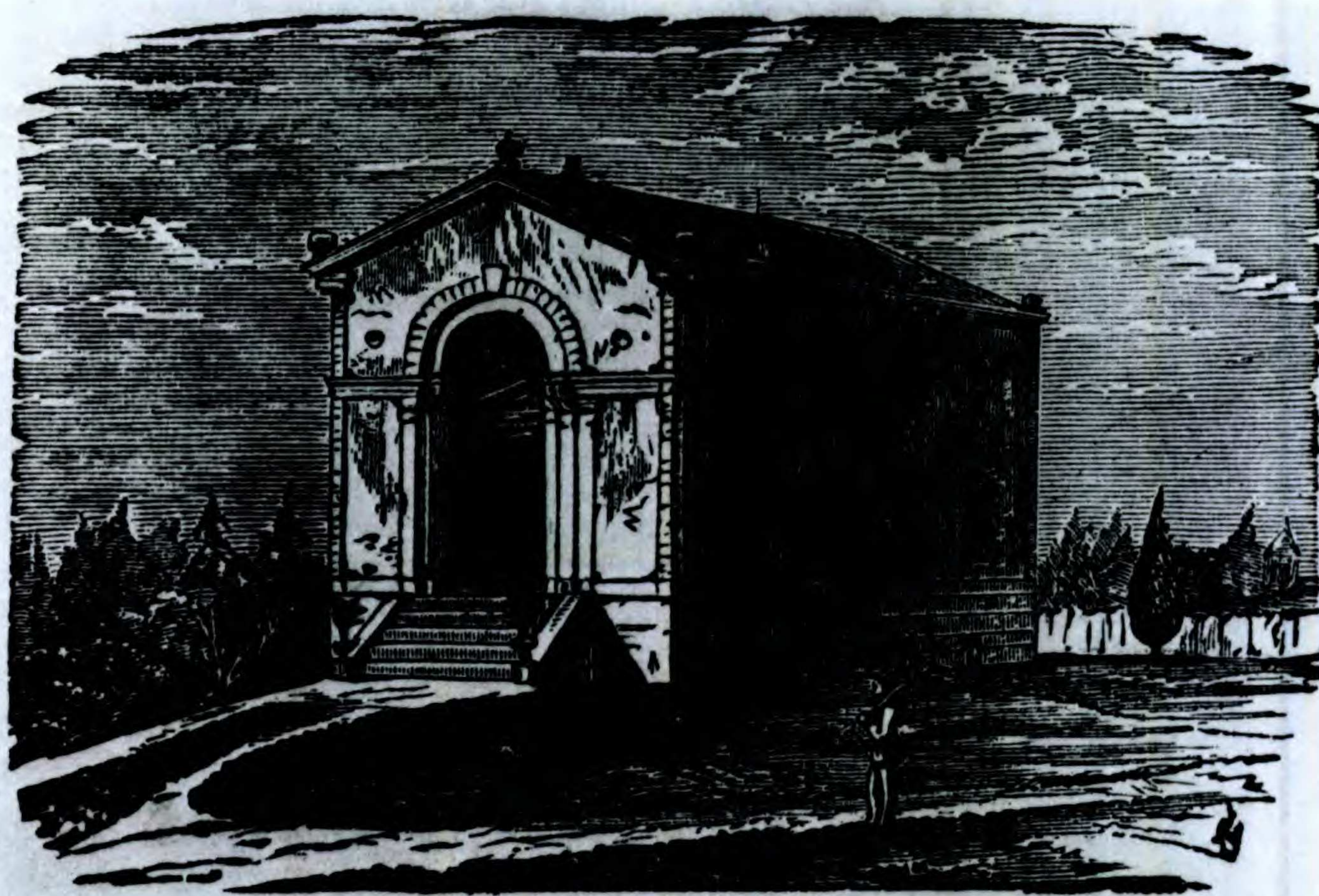


FIGURE 3. Plan of Jardin des Plantes when the Jardin du Roi, from J. B. Pujoux, *Promenades au Jardin des Plantes, à la Ménagerie et dans les Galeries du Muséum d'Histoire Naturelle . . . Troisième édition*, Paris, Librairie Economique, 1803. (Tome premier.) (Courtesy of Hunt Institute for Botanical Documentation, Carnegie Mellon University, Pittsburgh, Pennsylvania.)



THE MUSEUM—SHAW'S GARDEN.

FIGURE 4. The Museum Building at the Missouri Botanical Garden during the lifetime of Henry Shaw, from J. A. Dacus & James W. Buell, *A Tour of St. Louis; or, the Inside Life of a Great City*, Western Publishing Co., St. Louis, 1878.

botanical garden adjacent to his country villa, Tower Grove.¹⁴ Property nearby had been given to the city to develop, with his advice and assistance, an elaborate pleasure park with walks and roads, Tower Grove Park.¹⁵

With significant input from Asa Gray, who visited Henry Shaw in 1884 and again in 1885, aiding him in his plans, Shaw drafted a will in 1885.¹⁶ It provided that upon his death the Missouri Botanical Garden, founded by him and approved by the General Assembly of The State of Missouri in 1859,¹⁷ would have income from an endowment to be administered by a self-perpetuating Board of Trustees, which appoints the director to oversee the running of the Garden. It states that the Garden, "should be forever kept up and maintained for the cultivation and propagation of plants, flowers, fruit and forest trees, and other productions of the vegetable kingdom; and a museum and library connected therewith, and devoted to the same and to the science of botany, horticulture, and allied objects"¹⁸ At Gray's suggestion, Shaw decided a set yearly stipend for support of a botany school

at Washington University, to be known as The Henry Shaw School of Botany, and a professorship, to be known as the Engelmann Professor.¹⁹

William Trelease, then a professor of botany at the University of Wisconsin, was appointed the first Engelmann Professor and Director of the School in 1885. When the Trustees met upon Shaw's death in 1889 to carry out the terms of his will, Trelease was also immediately selected to be the first director of the Missouri Botanical Garden (Fig. 6).²⁰ A northeasterner with an undergraduate degree in entomology from Cornell University under John Henry Comstock (1880) and a doctorate from Harvard University under William Gilson Farlow (1884), Trelease was recommended by Gray and others as the most suitable person to lead the new school of botany. Trelease had already made a name for himself in published studies of insects, pollination, fungi, and plant morphology. His doctoral thesis on bacteria was the first on this group in America, and his bacteriology course at Wisconsin was perhaps the first one offered there. He had strong connections with the Eastern Coast bo-



INTERIOR OF PLANT HOUSE.

FIGURE 5. Inside view of the Plant House during Henry Shaw's lifetime, from J. A. Dacus & James W. Buell, *A Tour of St. Louis; or, the Inside Life of a Great City*, Western Publishing Co., St. Louis, 1878.

tanical establishment, and through his Wisconsin experience, some midwestern ties.

Trelease proved to be the ideal person to implement the spirit and substance of the Shaw-Engelmann-Gray vision of the Missouri Botanical Garden. Once moved into the Tower Grove House, Trelease quickly realized the serious problems with the Garden's physical plant. He at once began to improve the grounds and buildings with the help of James Gurney. Trelease also initiated a strong research and teaching program. He built a substantial herbarium of plants from the southwestern states by

collection and purchase, and made monographic studies, as did others at the Garden, on plants of the region.

Imagine the Garden in the year of the Louisiana Purchase International Exposition in 1904. This largest and most elaborate World's Fair up till that time²¹ drew many to St. Louis and to the Garden. Trelease, after his 14 years as the director, was proud of the Missouri Botanical Garden. Once inside the gate in the high stone wall around the Garden visitors would find that "11,357 species and varieties of plants were in cultivation."²² After

visiting the outside garden, lily pools, some with the large *Victorias*, a large area with native American flowers, an orchard, a fructicetum, and a large arboretum, one could enter a number of recent interconnected greenhouses. Some outside plantings and greenhouses were devoted to yuccas and agaves, which both Engelmann and Trelease studied. Tower Grove House, with a wing added in 1890, was the director's residence. Shaw's city house, rebuilt at the Garden in 1891, contained the offices, and much of the herbarium and library; an added wing was to be built in 1909. Some of the herbarium and library still were housed in the Museum Building, which also included a few laboratories.

Trelease had put most of his energy into building a sound foundation for the future research and teaching programs. The herbarium in 1889 consisted of about 160,000 specimens, many unprocessed, from the Bernhardt, Engelmann, and Nicholas Riehl collections; in 1904 it had five times the number, or about 490,000 specimens.²³ Included were purchases or gifts of some major collections made by Ferdinand Blanchard, Farland Carr Broadhead, Samuel Botsford Buckley, Benjamin Franklin Bush, Alvan Wentworth Chapman, J. Q. Adams Fritchey, Gustav Jermy, Joseph Finley Joor, Sadie F. Price, John Howard Redfield, the Reverend Ernest C. Smith, E. Lewis Sturtevant, George Thurber, as well as Trelease's own collections. The library in 1889 had about 428 volumes from Henry Shaw's purchases and other books, some from George Engelmann's library, totaling about 3,000 volumes; in 1904 it had 45,815 volumes or an increase of over 15 times.²⁴ But numbers alone do not tell the whole story. In 1892 E. Lewis Sturtevant donated an important collection of 463 pre-Linnaean books and his own manuscripts and notes. Then in 1902, a large collection of pre-Linnaean books was purchased from a German bookseller. Together, these collections made the Garden a significant repository of early botanical literature. Jens Christian Bay, newly arrived from Denmark, was hired to prepare a catalog of the Sturtevant Collection.²⁵ Bay was later to become the librarian at the Crerar Library in Chicago. The catalog was published in the *Missouri Botanical Garden Annual Report*, a publication that served from 1890 until 1912 as an outlet for publishing Garden research results. Scientific research was the primary goal of Trelease's plans, and he himself had begun major monographs of *Yucca* and *Agave* done when he had time to travel and do research.

Specialization in herbarium collections had begun. Because the Engelmann herbarium was strong



FIGURE 6. William Trelease in 1903 at age 46. (From the archives of the Missouri Botanical Garden.)

in plants of Texas and the Southwest, these collections were selectively increased by collecting expeditions. It is interesting to note that a start was made on an African collection by paying S. P. Verner, who had brought African Pygmies to the World's Fair, to collect plants in the Upper Congo.²⁶

Bright young students were employed as assistants by Trelease. Some of them were to become important botanists: Albert Spear Hitchcock, Lewis Hermann Pammel, Frederick Hinsdale Horsford, and J. Arthur Harris. He encouraged Hermann von Schrenk, a plant pathologist associated with the United States Department of Agriculture, to locate his laboratory at the Garden, where he maintained it for 50 years.²⁷

Though it was difficult to get a new major graduate teaching program instituted, a school for gardeners was quickly established. This was one of Shaw's designated programs, probably because he and Asa Gray had so much trouble finding well-trained American gardeners.²⁸ This significant school was to last into the 1930s.

The successful 1904 World's Fair led to op-



FIGURE 7. The Missouri Botanical Garden/Mill Hill School exhibit at the Louisiana Purchase International Exposition, St. Louis, 1904. (From the archives of the Missouri Botanical Garden.)

portunities for the Garden.²⁹ The Garden had an exhibition in association with the Mill Hill School, which showed living plants, preserved local mushrooms, pictures of the Garden and Shaw, and Garden publications (Fig. 7). This exhibit, together with various living flowers that won awards in competitions, gave the Garden favorable publicity. At the close of the Fair, some of the exhibitors provided exotic living plants, thus increasing the Garden's holdings from such countries as Brazil, China, Cuba, and the Philippines.³⁰

Trelease was successful in establishing a superb reputation for the Garden in the botanical scientific community. He was less successful in convincing the Board of Trustees that his was the right direction. In 1912, as a result of increasing disagreement with the Board, Trelease resigned. The disagreements had become acute a year before when a new president of the Board was elected and, as Trelease wrote to his mentor Farlow, he was advised that "we're going to have more garden and less science, now."³¹ Trelease was not willing to compromise his principles, and his resignation by agreement was announced as a "retirement" to do research, few knowing the real reasons. George T.

Moore, who had been brought in by Trelease in 1909 as professor of plant physiology in the plans to expand the graduate program, became the new director. Trelease also had hired George Pring, a Kew-trained gardener who was later to make a reputation as a water lily breeder, to be in charge of orchids and exotics.³² Some able people were still in charge, but programs were in need of further implementation.

George Thomas Moore (1871–1956; see Fig. 8) was a midwesterner by birth and early education, with an undergraduate degree from Wabash College in Indiana in 1894.³³ His graduate training was from Harvard University, working with William G. Farlow (A.M. 1896, Ph.D. 1900), and then teaching at Dartmouth College in New Hampshire (1899–1901). He was algologist and plant physiologist with the Bureau of Plant Industry, United States Department of Agriculture, from 1901 to 1909, and was in charge of its plant physiology laboratory since 1902. Moore's background made him an ideal selection for Trelease to put in charge of the graduate program at the Garden and Washington University in 1909. Moore's research was with algae and bacteria, both



FIGURE 8. George Thomas Moore after becoming director of the Missouri Botanical Garden. Photographed by S. D. Whiting. (From the archives of the Missouri Botanical Garden.)

pure and applied. At the Bureau of Plant Industry he perfected methods to rid water supplies of pesty algae, and to inoculate plants with nitrogen-fixing bacteria. He was a skillful speaker, writer, teacher, and promoter of botany.

It was no wonder that Moore impressed the director's search committee of the Board with his clear descriptions of what needed to be done at the Garden.³⁴ He had the ability of being able to speak to businessmen on their own terms. For example, after being the director for three years, he told the Board that ". . . the increase in the service of the activities, such as the herbarium, laboratories, etc., has been quite as great as the increased number of visitors. As a matter of fact, the development of what may be termed the strictly scientific side of the Garden shows more tangible results for the amount of money which is annually devoted to this purpose than the Garden proper; and so far as a return upon the investment is concerned, may always be expected to be the most fruitful of the Garden activities."³⁵ He at once set out to improve the show aspects with frequent floral displays, well-kept grounds, and innumerable press releases producing publicity that attracted large crowds. By using comparisons with other institutions in St. Louis and elsewhere, by stressing practical uses of research, for example cancer research and water

and air pollution research, and by persuasion, Moore also was able to expand the scientific and educational programs, something that Trelease had been unable to accomplish. When Jesse M. Greenman was hired by Moore in 1913 to be curator of the herbarium, he was charged with preparing a southwestern flora, a task never completed. Moore soon got on an equal footing with the Trustees by being first an ex-officio member of the Board as the president of the St. Louis Academy of Science in 1918, and then in 1928 by being elected as a lifetime regular Trustee.³⁶ Further, because the Board had so much confidence in his abilities, he was able to eliminate the required monthly budget requests, to curtail the written monthly reports of the director, and dispense with the oversight of Garden operations by the Garden committee of the Board. In short, Moore was able to run the Garden with less and less direct supervision by the Trustees.

To examine Moore's achievements, imagine how it would have been to visit the Garden in the middle of his 41-year directorship, in the year 1926.³⁷ Upon entering through the recently enlarged and redesigned gate, one would find lily pools leading to new large greenhouses, one of which was a floral display house with continuous ornamental displays. In the rear of the greenhouses was an elaborate sunken Italian garden with pergola. A new rose

garden, economic garden, and many simplified manicured ornamental flower beds were well cared for. A director's residence had been built south of the Administration Building.

The scientific staff in 1926 included: Benjamin M. Duggar, plant physiologist; Jesse M. Greenman, curator of the herbarium; Edward A. Burt, librarian (in name only) and mycologist; Edgar Anderson, geneticist, also in charge of the Gardeners' School; Hermann von Schrenk, plant pathologist; and a second mycologist, David H. Linder, Farlow's nephew, soon to be replaced by Carroll W. Dodge from Harvard. Scientific programs were active, with results being published in the quarterly *Annals of the Missouri Botanical Garden* initiated in 1914 to replace that function in the old *Annual Reports*. Information and popular articles now appeared in the *Bulletin*, started in 1913. An active research project was collecting and studying the Southwestern flora, concentrated on the plants of Missouri, Arkansas, and Texas. Julian Steyemark, a graduate student, was to study the Missouri flora then, and for years to come.³⁸ A newly opened tropical station of the Garden in Balboa, Panama Canal Zone, encouraged plant collecting and the flora of Panama project later to develop.³⁹ Research in plant physiology, particularly of fungi, plant pathology, mycology, and plant breeding was in progress. Moore gave up his active research to spend time in administration, teaching, and public speaking.

The Garden was becoming noted in horticultural circles for its water lily and orchid hybridization. Collected and donated orchids had made the Garden preeminent in this country for its extensive living collection of orchid species.⁴⁰ James Gurney and George Pring were active in the hybridizing program. Unfortunately, the excessive smog of soft coal particles was damaging outside plantings and indoor orchids. The orchids were not only important for displays, but also for income by supplying local florists. Moore campaigned with those in the city who sought smoke abatement laws, but progress was slow.⁴¹ As a result of the smoke problem, the Trustees, with the court's approval, sold land adjacent to the Garden in order to purchase an out-of-town site for plants, particularly for trees, and greenhouses for orchids. In 1925, extensive property on the Meramec River at Gray Summit was purchased, to be called at a later date the Shaw Arboretum.⁴²

In 1926 the future for the Garden seemed bright. However, in a few years that was to change drastically. The Great Depression affected value and income from the properties from which the Gar-

den's operating funds came. Even after the Depression had abated, these properties did not recover enough to help the Garden recover. Moore was getting older and less energetic. He kept up a good front at the same time that he was economizing by moving the plant physiology to the university, decreasing the number of gardeners, cutting the number of floral displays, and limiting the budget for library, herbarium, and grounds. Edgar Anderson was to write of this period that Moore "... retrenched as skillfully as he advanced,"⁴³ which meant that many did not realize the seriousness of the Garden's problems. Moore attempted to raise funds through his extensive social contacts, and by the formation in 1939 of a Friends group. However, because of the immense needs for repairs, replacement, and catching-up, these efforts turned out to be insufficient. Then, too, Moore's health deteriorated and Edgar Anderson was made assistant director in 1951. The Trustees seemed to be little involved with solving the problems.

In short, the Missouri Botanical Garden was in the doldrums in 1953 when a new Board president, John S. Lehmann, was elected and when Moore became Director Emeritus. The scientific community scarcely realized the situation because many of the research programs and their publications continued, including the *Flora of Panama*, even though the tropical station had closed some years earlier. But the physical plant and gardens were in disrepair.

The directorship of Edgar Anderson (Fig. 9), which began in 1954, was to last only a few years; however, Anderson and his assistant Hugh Cutler made significant changes. Anderson's long connection with the Garden began in 1922 when he came as geneticist and assistant professor at Washington University, fresh from the Bussey Institution of Harvard University with a doctor of science degree.⁴⁴ He was also in charge of the gardeners' school. Growing up in East Lansing, Michigan, where his father was a professor of animal husbandry at Michigan State College, Anderson received his undergraduate degree there in 1918. In 1931 he returned to Harvard's Arnold Arboretum as arborist for four years, and then explored the Balkans in 1934–1935 to collect horticulturally promising strains of ivy, boxwood, and holly. He returned to the Garden in 1935 as geneticist and in a few years was also the Engelmann Professor of Botany at Washington University. Moore had high regard for Anderson's abilities, and recognition was to come to Anderson for his innovative research on plant hybridization and evolution. He



FIGURE 9. Edgar Anderson in 1950, a few years before becoming director of the Missouri Botanical Garden. Photograph by George Dorrill Photographers. (From the archives of the Missouri Botanical Garden.)

described himself as “blunt and unconventional,” a description with which most agreed. He was an outstanding and original thinker. As Ledyard Stebbins wrote, “No plant scientist known to me was more able than Edgar Anderson to compare in their natural habitat the leaves, flowers, and wonderfully symmetrical architecture of plants and to express their interrelationships in a meaningful way.”⁴⁵

Although Anderson had become the assistant director in 1951, even earlier he had taken particular interest in the horticultural aspects of the Garden and Arboretum by working with garden clubs and other special interest groups. By temperament and desire he was ill-suited to be an administrator. However, he and some of the Trustees believed that the Garden needed new direction, so he reluctantly agreed to be director for a while. With Cutler's help he tried to revitalize the Garden's programs. In the process of trying to make rapid changes, he managed to alienate many of the older staff members. Robert Woodson, who had been the curator of the herbarium since 1948 and coordinator of the *Flora of Panama* and had pushed the building up of African collections, retreated to the university and disassociated himself from the herbarium administration. Carroll Dodge was upset by the sale of the fungi collections and the transfer of portions of the library and came less and less to the Garden. A number of senior Garden and Arboretum employees either left or were unhappy with the changes. These changes included moving the orchids back to the Garden with elimination of many duplicates, and the dis-

mantling of the greenhouses at the Arboretum. A part of the Garden's land on Magnolia Avenue was given to the National Council of State Garden Clubs to build its headquarters. A strong emphasis was given to involving garden clubs and interested amateurs in helping the Garden in practical and monetary ways. Physical plant improvements were pushed and a National Science Foundation grant was obtained to improve the herbarium and library facilities.⁴⁶ Fern specialist Rolla M. Tryon, who came in 1948 as the assistant curator of the herbarium and associate professor at Washington University, organized a small systematics symposium for faculty and students of midwestern institutions in 1953.⁴⁷ The following year, this was expanded with the help of a National Science Foundation grant, and the annual symposium became a tradition.

Progress was slow and attendance at the Garden did not begin to increase until 1956. Because of ill health and frustration with administrative procedures, Anderson soon resigned to become Curator of Useful Plants and spend his time with his beloved research and teaching. He continued to be awarded research grants and recognitions, including the prestigious Darwin-Wallace Medal from the Linnean Society of London in 1958. The Board was now searching for a decisive leader to be director.

Frits Warmolt Went, California Institute of Technology Professor, Director of the Earhart Laboratory Phytotron, which he helped design, and eminent botanist, was selected to be director in



FIGURE 10. Frits Warmolt Went inside the Climatron while director of the Missouri Botanical Garden, about 1969. Photograph by Arthur Fillmore. (From the archives of the Missouri Botanical Garden.)

1958.⁴⁸ At the time he wanted to take a short leave from Cal Tech, and the Garden directorship offered him an opportunity to try out some of his ideas about botanical garden functions. He had impressive international experience with botanical gardens, having grown up in one in Utrecht, where his father was director and where he did his doctorate on pioneering studies of plant hormones. He had been associated some years with the Royal Botanical Garden in Bogor, Java, and had connections with several West Coast United States gardens. An urgent need in St. Louis was the replacement of large deteriorating greenhouses, a challenge that especially intrigued him.

Went believed that the Garden's prime aim was to develop a public awareness of plants by innovative educational displays. By doing this, public support and interest would be assured and would help to develop an increased research program. At

first Went had thought that the research should be done at the University, but soon decided that some research should be done at the Garden in a future new building.

In the five years of his directorship, most of Went's efforts went into implementing this plan. At the suggestion of the firm of Murphy and Mackey, a greenhouse in the form of a Buckminster Fuller geodesic dome was decided upon rather than a traditional greenhouse. From his previous experiences, Went knew that many tropical plants needed summer cooling to do well in a greenhouse. Thus, air conditioning as well as heating was needed to provide year-round temperature control. Went named the new greenhouse the "Climatron," because the dome could allow several types of tropical climates by gradient conditions of temperature and moisture. The Climatron, opened in October 1960, sparked much public interest and attracted large paying crowds. (Fig. 10). It served to educate the public on aspects of plant growth under varying conditions, even though the anticipated climatic conditions were not completely controllable. As a building, it received international recognition for its design and concept.⁴⁹

With the aid of Board President Robert Brookings Smith, and the help of the Friends groups, substantial contributions were received to help build the Climatron and to make other improvements. Other innovations were made: several concerts were held; East Indian food was served at a food stand; and special programs in botany for children were instituted. Exotic plants, particularly orchids, were obtained by Went on his many travels.

After a while, Went envisioned making the Garden the cultural center of St. Louis. It was to be a floral pavilion with places for musical events, theater, art, lectures, and restaurants. The city was considering a new cultural center development and thus the Garden became a contender for the site.⁵⁰ Some Trustees did not believe that this was an appropriate function for the Garden, nor did they think it affordable. Disagreement led to the resignation of the Board president, even as the City Planning Commission put the Garden fourth on its list of favored sites for a cultural center. Eventually frustration led Went to resign in 1963. Earlier he had begun to obtain funding for a new research building, but much more money was still needed.⁵¹

Went had revitalized the Garden in the eyes of the public. He had drawn attention to its potential as a cultural force in St. Louis. However, he had not been as able an administrator nor as successful in promoting research as he wanted. The Board of

Trustees was now suspicious of grandiose plans for future deficit development and sought the assistance of outside scientific reviewers for guidance.

In 1965 David M. Gates (Fig. 11) became its new director after two years of indecisiveness and deteriorating research at the Garden. Gates, trained as a physicist but interested in nature since childhood, was in 1965 well known for his original program of applying physics to ecological problems. He had recently become Professor of Natural History at the University of Colorado, a position especially designed for his unique qualifications. Gates was an outstanding scientist who had administrative experience with the American Embassy and the Office of Naval Research in London. He felt that the Garden needed firm direction to overcome the deteriorating horticultural and research programs. He believed that his ecological knowledge would be useful as a research direction for the Garden.⁵²

Born a midwesterner, with all of his degrees from the University of Michigan, Gates seemed able to understand St. Louis better than Frits Went had. His first goals were to reestablish credibility with the Board, to promote fiscal responsibility and a balanced budget, to seek new sources of funding, and to rebuild the research and graduate programs at the Garden. With his assistant, Mark Paddock, he was able in his six years of directorship to achieve these interconnected goals. He instituted a general admission charge. He hired new researchers and staff. With their help, he was able to obtain grants for support of Garden activities. He initiated a \$3 million Capital Fund Drive to help fund a new herbarium and library building, make other improvements, and obtain a development plan. In his first three years he had increased the total staff by 50%, and the scientific staff by 200%.⁵³ Budgets had been balanced each year. Research in systematics had been revitalized by the new Director of the Herbarium, Walter H. Lewis, and the new Curator of Cryptogams, Marshall R. Crosby. Grants were obtained for support of herbarium and library improvements and for significant research. A major grant was obtained to help with the construction of a new herbarium and library building, to be named the John S. Lehmann Building, which was completed in 1972. The herbarium passed its two millionth specimen mark, and the *Flora of Panama* project was moving ahead with new and old staff, including John D. Dwyer, a professor at St. Louis University, who had been involved since Woodson's time. A new herbarium and library were established in the Panama Canal Zone as well.⁵⁴



FIGURE 11. Director David Murray Gates measuring the temperature of a rose at the Missouri Botanical Garden. Photograph by Claude Johnston. (From the archives of the Missouri Botanical Garden.)

The Gates administration was to write that "The inertia gripping this institution for the last 30 years has been overcome. We have taken positive steps to fulfill our proper role in this community and in the significant world."⁵⁵ Optimism was returning to the staff and all seemed on track when Gates left to become director of the University of Michigan's Biological Station in 1971. He had built up a large, funded, biophysical ecology program at the Garden and Arboretum. This sort of ecological research was to leave with Gates, at the same time that the revitalized systematics program was to persist and grow when systematist Peter H. Raven came immediately to become director.

Raven (Fig. 12) who grew up and went to school in California, was an outstanding young botanist teaching at Stanford University. He had diverse interests in systematics, ethnobotany, ecology, evolutionary biology, and general natural history.⁵⁶ In the 18 years of Raven's directorship, with the help



FIGURE 12. Peter Hamilton Raven shortly after becoming the director of the Missouri Botanical Garden. (From the archives of the Missouri Botanical Garden.)

of his wife Tamra, and for some years of William Klein, the Garden has moved forward on many fronts. Some new focus gardens were designed: an English woodland garden; a new rose garden, and a Japanese garden. These, together with expanded floral displays, added outdoor sculptures, and special events have quadrupled attendance since 1971, resulting in more than 800,000 visitors a year with a staff of about 250 people. The Ridgway Center, a new entrance building containing various facilities and the public education programs, opened in 1982. The Lehmann Building was renovated in 1987 to make it more useful for its growing herbarium and library functions.⁵⁷ The Climatron is being renovated with glass replacing plexiglass and should reopen next year. [The Climatron did reopen in March 1990.]

It is the area of research, particularly in systematics and tropical ecology, where the Missouri Botanical Garden has taken leadership. With a scientific staff of about 40 scattered throughout the world, and a herbarium of 3.6 million specimens, the Garden has accomplished much. It has

been able to receive tax support for the first time, which together with an expanded volunteers program, allows it to do much. It continues to have a significant interest in the flora of Central America, particularly Panama and Nicaragua, and be a major focus for the *Flora Mesoamericana* project. It has been investigating the South American floras, particularly those of the northern part. Africa, particularly the rapidly changing flora of Madagascar and southern Africa, has been an interest of the Garden for many years and continues to engage researchers. The North American flora project is now housed at the Garden, and a new flora of China project is developing. Very active research continues on bryophytes and ferns. The Garden is a major center for study of the plant kingdom at the organismal and higher levels. Went, Gates, and Raven have been actively involved in national and international botanical activities.⁵⁸

So we come to the end of this brief history of the Missouri Botanical Garden. The eccentric essayist-historian Lytton Strachey once wrote that "ignorance is the first requisite of the historian,"⁵⁹ because the historian must be selective and interpretive and must ignore much. Perhaps it would be more accurate to say that the historian is more like a maker of myths, myths that have one or more morals. What then is the mythology of the Missouri Botanical Garden? In my view, one moral is that an institution with a divided administrative structure, Board and Director, can thrive, though at times there may be strong conflicts. Another moral is that a botanical garden, with strong traditions, can be an effective force for good in a community and in society. The Missouri Botanical Garden, for example, has helped to beautify St. Louis, and helped to clean up its air, has educated Missourians about their natural and horticultural heritage, and has helped expand people's view of the importance of vegetation for human survival. It has shown that botanical and horticultural research can be made meaningful to the general public.

I have reviewed how the founder and six directors, each with differing views of its mission but all concerned with education and research, have molded the Garden. The ordinary citizen and the scientific community have been educated in the importance of the Garden's research, whether it be through a flora of Missouri or Panama, a new hybrid water lily, an understanding of the genetics of significant crop plants, an experiment with an ecologically designed greenhouse, or a race to know the plants of the disappearing tropical rainforests. The mythology of the Missouri Botanical Garden

is one that is real, perhaps more real than fact or history.

NOTES

4. Henry Shaw manuscripts, M.B.G. archives, box 3 of botanical manuscripts, 1876 or later, beginning "American Trees."
5. The best source of information about Shaw is the recent biography by William Barnaby Faherty, S.J., *Henry Shaw, His Life and Legacies*, Univ. Missouri Press, Columbia, Missouri, 1987, 228 pp. Other useful sources are: Thomas Dimmock, "Henry Shaw, a biographical sketch," [*Annual Report*] *Missouri Botanical Garden* [1st], St. Louis, 1890, pp. 7–28. (Reprinted as pamphlet n.d. but probably late 1930s, 30 pp.); E[dgar] A[nderson], "Henry Shaw—a pictorial biography," *M.B.G. Bull.* 42: 103–118, 1954; Edgar Anderson & Dorothy Brockhoff, "Henry Shaw, a pictorial biography," *M.B.G. Bull.* 55(6): 1–16, 1967; and Jean Marie Denken & James R. Reed, "Henry Shaw, his life and legacy," [unpaged pamphlet, M.B.G., St. Louis] n.d. (probably 1977).
6. For example, see: N. S. B. Gras, "An early sedentary merchant in the Middle West, records available for a study of the career of Henry Shaw," *Bull. Business History Soc.* 18: 1–9, 1944; Dana O. Jensen, "The enigma of Mr. Shaw," *Missouri Historical Soc. Bull.* July 1959, pp. 311–318; James Neal Primm, "Henry Shaw, Merchant Capitalist," *Gateway Heritage* 5(1):2–9, 1984; and Faherty, 1987.
7. The literature on the history of botanical gardens is extensive. A few examples are: Wolfgang Born, "Botanical gardens," *Ciba Symposia* 11: 1093–1124, 1949; Frans Verdoorn, "Botanical gardens and arboretums of the past and their reconstruction," *Annee Biol.* 29: 275–282, 1953; W. B. Turrill, *The Royal Botanic Gardens Kew; Past and Present*, Herbert Jenkins, London, 1959, 256 pp.; William Thomas Stern, "Botanical gardens and botanical literature in the eighteenth century," in Allan Stevenson (compiler), *Catalogue of Botanical Books in the Collection of Rachel McMasters Miller Hunt*, 2(1): xli–cxl, 1961; Edward Hyams, *Great Botanical Gardens of the World*, Macmillan Co., New York, 1969, 288 pp.; H. R. Fletcher & W. H. Brown, *The Royal Botanic Garden, Edinburgh, 1670–1970*, H.M. Stationery Office, Edinburgh, 1970; C. D. Darlington, "The Oxford Botanic Gardens: 1621–1971," *Nature* 233: 455–456, 1971; W. T. Stern, "Sources of information about botanic gardens and herbaria," *Biol. J. Linnean Soc.* 3: 225–233, 1971; Wilfrid Blunt, *In For a Penny; a Prospect of Kew Gardens: Their Flora and Falballas*, Hamish Hamilton, London, 1978, 218 pp.; and A. D. Boney, *The Lost Gardens of Glasgow University*, Christopher Helm, London, 1988, 298 pp. Information about the garden at Padua can be found in: David W. Lee, "Padua," *American Horticulturist* 59(4): 18–21, 1980; and Lucia Rossetti, *The University of Padua; an Outline History*, Trans. A. W. M. Hargraves, Edizioni Lint, Trieste, 1983, 75 pp.
8. See, for example: Philip C. Ritterbush, *Overtures to Biology; the Speculations of Eighteenth Century Naturalists*, Yale Univ. Press, New Haven, 1964, 287 pp.; Lorin Anderson, "Charles Bonnet's taxonomy and chain of being," *J. Hist. Idea* 37: 45–58, 1976; John Prest, *The Garden of Eden; the Botanic Garden and the Recreation of Paradise*, Yale Univ. Press, New Haven, 1981, 122 pp.; and Janet Browne, *The Secular Ark; Studies in the History of Biogeography*, Yale Univ. Press, New Haven, 1983, 273 pp.
9. Letters from Shaw to Hooker in 1856 and 1857 are in the archives of the Royal Botanic Gardens Kew (Book 64) and from Hooker to Shaw in 1857 and 1858 are in the archives of the Missouri Botanical Garden (Director's Office Scrapbook 1857–1890).
10. Shaw letter to Hooker, Aug. 10, 1886 (Book 64, # 360).
11. Some examples are: "Sir William, kind, active and strong as he is, promises to do any thing for your establishment you may desire, by advise [sic] and by sending seeds and plants suited for our climate and in any other way. He seems to take much at heart this business, and hopes that you will be able to establish a model botanic and agriculture garden, and Herbarium and Museum in the centre of North America." G. Engelmann to H. Shaw, Kew, Aug. 11, 1857 (M.B.G. archives, Director's Office Scrapbook 1857–1890); "As your endowment is quite unprecedented in this country, if not anywhere, at least in extent and capabilities, I was naturally anxious in respect to its plan and its prospects. You know from conversation what my ideas and my hopes are for its future, and that I am very confident of its complete success and enduring usefulness." A. Gray to H. Shaw, Cambridge, May 29, 1884 (M.B.G. archives, Director's Scrapbook 1857–1890); "Mr. Shaw took me into his counsel and, without going here into details, without seeing a chance for doing much while Mr. Shaw lives, which cannot be very long, I see there is a great opportunity coming, and I think that none of the provisions he has made will hinder the right development of the Mississippian Kew, which will hardly be 'Kew in a corner.' And if he follows my advice and mends some matters, there will be a grand foundation laid." A. Gray to J. D. Hooker, Cambridge, June 9, 1884, in Jane Loring Gray (editor), *Letters of Asa Gray*, Boston, 1894, p. 753.
12. "Another thing that I have at heart is the offer that has been made of an excellent and very rich Herbarium, that of the late Prof. Bernhardt at Erfurth. It can be had now for something like 600 dollars and has cost more thousands (—they tell me of 8–10,000 dollars) to amass. Application ought to be made soon.—What do you think of this trifle of \$600 for such a treasure—and what of the sum for a library?" G. Engelmann to H. Shaw, Kew, Aug. 11, 1857 (M.B.G. archives, Director's Office Scrapbook 1857–1890). See also: *Trans. Acad. Sci. of St. Louis* 1: 316, 1856–1860; "Early collections in the Garden herbarium," *M.B.G. Bull.* 7: 29–35, 1919; and William G. D'Arcy, "Mysteries and treasures in Bernhardt's herbarium," *M.B.G. Bull.* 59(1): 20–25, 1971.
13. A photograph of Henry Shaw lying in state in the Museum is in the M.B.G. archives and is reproduced in *Gateway Heritage* 5: 9, 1984; "... no attempt can be made to form a museum and the specimens collected by Mr. Shaw for the purpose have suffered to such an extent as to be for the most part worthless, owing to the ravages of insects and the accumulation

- of dust during many years." *2nd Ann. Report M.B.G.*, p. 25, 1891.
14. The earliest published guide to the Garden was that of 1893, *Missouri Botanical Garden*, Board of Trustees, [St. Louis], 9 pp., 11 pls., 1 folding map. Other guides were published as they were revised at later dates.
 15. D. H. MacAdam, *Tower Grove Park of the City of St. Louis*, R. P. Studley & Co., St. Louis, 1883, 119 pp.; T. V. Brumfield, "A study of philanthropy: Tower Grove Park," *Missouri Historical Soc. Bull.* 21: 315-322, 1905; [D. H. MacAdam], "Tower Grove Park. A careful review of its foundation and history," *The Republic*, June 26, 1890; "Shaw's living legacy: Victorian grandeur and modern fun mix," *M.B.G. Bull.* 64(8) u.p., 1976; and Robert E. Knittel, *Walking in Tower Grove Park, a Victorian Strolling Park*, 2nd edition, Grass-Hopper Press, St. Louis, 1983, 105 pp.
 16. "Henry Shaw's will. Admitted to Probate at St. Louis, Sept. 2, 1889." [1st] *Ann. Report M.B.G.*, pp. 29-55, 1890; this has been reprinted in pamphlet form over the years, the latest printing being: *The Will of Henry Shaw Establishing the Missouri Botanical Garden and Other Documents Pertaining Thereto*, M.B.G., St. Louis, 1986, 45 pp.
 17. "An act to enable Henry Shaw to convey or devise to trustees certain lands." (Reprinted from Missouri Sessions Acts of 1859, p. 434) [1st] *Ann. Report M.B.G.*, pp. 26-28, 1890.
 18. *Ibid.* p. 26.
 19. *Ibid.* pp. 36-37.
 20. No definitive biography of Trelease is available. The best published sources are: L. H. Pammel, *Prominent Men I Have Met, III, Dr. William Trelease*, the Author, Ames, Iowa, 1927, 84 pp.; J. Christian Bay, *William Trelease 1857-1945, Personal Reminiscences*, the Author, Chicago, 1945, 12 pp.; J. T. Buchholz, "William Trelease 1857-1945," *Science* 101: 192-193, 1945; J. M. Greenman, "William Trelease," *M.B.G. Bull.* 33: 71-72, 1945; Louis Otto Kunkel, "William Trelease, February 22, 1857-January 1, 1945," *Biographical Memoirs, National Academy of Sciences of the United States* 35: 307-332, 1961; and Joseph Ewan, "Trelease, William," in C. C. Gillespie (editor), *Dictionary of Scientific Biography* 13: 456, Charles Scribner's Sons, New York, 1976. The papers of Trelease are in the archives at Cornell University and the University of Illinois. An extensive bibliography is found in Kunkel, 1945. The only negative assessment of Trelease known to me is by Marcus E. Jones: "... I am compelled to say that in my judgment he has no scientific judgment and is utterly unfit to monograph any genus . . .," quoted in Lee W. Lenz, *Marcus E. Jones, Western Geologist, Mining Engineer and Botanist*, Rancho Santa Ana Botanic Garden, Claremont, 1986, p. 205 (I thank Joseph Ewan for calling my attention to this).
 21. Much has been written about the Fair. Some examples are: *The Greatest of Expositions, Completely Illustrated. Official Publication*, Official Photographic Company of the Louisiana Purchase Exposition, St. Louis, 1904, 288 pp.; Margaret Johanson Witherspoon, *Remembering the St. Louis World's Fair*, Comfort Printing Co., St. Louis, 1973, 96 pp.; and James Neal Primm, *Lion of the Valley*, St. Louis, Missouri, Pruett Publishing, Boulder, Colorado, 1981, pp. 401-418.
 22. *Missouri Botanical Garden*, Board of Trustees, St. Louis, 1904, p. 3.
 23. *16th Ann. Report M.B.G.*, 1905, p. 20.
 24. The figure for Shaw's botanical library can be obtained from a manuscript "Catalogue of Books belonging to the Library of the Mo. Bot. Gardens" written by J. Monell probably about 1876, and from the inventory of the Town House and Tower Grove House prepared at Shaw's death, both in the M.B.G. archives; *3rd Ann. Report M.B.G.*, 1892, pp. 15-16; *16th Ann. Report M.B.G.*, 1905, p. 23; and Board of Trustees' Minutes, Apr. 10, 1912 (M.B.G. archives).
 25. [J. C. Bay], "The Sturtevant prelinnean library," *7th Ann. Report M.B.G.*, 1896, pp. 123-209; C. E. Hutchings, "A supplementary catalogue of the Sturtevant prelinnean library," *14th Ann. Report M.B.G.* 1904, pp. 233-316; Board of Trustees' Minutes, May 14, 1902 (M.B.G. archives).
 26. Board of Trustees' Minutes, Dec. 14, 1904 (M.B.G. archives).
 27. For further information about von Schrenk, see: Board of Trustees' Minutes, Mar. 9, 1904; Apr. 12, 1905; June 12, 1907; (M.B.G. archives); Guy Forshey, "Interesting St. Louisians, Dr. Hermann von Schrenk," *St. Louis Post-Dispatch*, Oct. 20, 1929, p. 5, 9; August P. Beilmann, "Hermann von Schrenk (1873-1953)," *M.B.G. Bull.* 41: 50-53, 1953; and James E. Cronin, *Herman von Schrenk: The Man Who was Timber, a Biography*, Kuehn, Chicago, 1960, 257 pp.
 28. "... have you got a man to spare—or do you know of a man—a practical man—gardener—tree-fancier—&c &c who could come and take charge of things. If you can light on a man with botanical knowledge enough, and get a *worker*—very well. If not I suppose we must have a botanical assistant here, to do what I have always to do—If we could put all in one, so much the better. If you cannot supply us—I have a Yankee Gardener in view, who for practical work might answer." A. Gray to J. D. Hooker, Cambridge, Dec. 27, 1871 (Asa Gray Kew Correspondence 1839-1873, Royal Botanical Gardens, Kew, archives).
 29. Board of Trustees' Minutes, Feb. 10, 1904; May 11, 1904, Nov. 9, 1904 (M.B.G. archives); *16th Ann. Report M.B.G.*, 1906, pp. 29-30.
 30. Board of Trustees' Minutes, Nov. 9, 1904; Jan. 11, 1905 (M.B.G. archives).
 31. "The work *has* been hard and uphill, but I hope that the results are really worth all it has cost me. There never has been a time when the Board has not been pretty equally divided between concentrating everything on decorative gardening and allowing me to make modest advances along the whole front of Henry Shaw's plan, but the late President, Mr. Lackland, had confidence in the plan and my ability to make the limited revenue do the wise thing to such an extent that scarcely a dissenting vote has been recorded on anything, and about four years ago my salary was increased with expression of the belief that my withdrawal would set the establishment back for years and that there was no dissatisfaction with me or opposition to my policies that would warrant me in considering leaving the Garden if tempted to

- do so. A new ruler has arisen in Egypt, who knoweth not Joseph, since Mr. Lackland's death, and a year ago the new President advised me that 'we're going to have more garden and less science, now' and that I should have to do a good deal of talking to bring him to agree with my suggestion that I would rather have him say 'more garden but no less science.' I did not tender my resignation then, for I felt that it would be wrong to abandon my part on such a proposition unless it were strongly enough based as to make further struggle hopeless. There is no question, though, now that I've opened a jack pot on queens but the President has four acres; but, as I told him, I'm enough of a sportsman not to whimper for my chips or to shoot up the room and bring the police down on the game. The outcome will probably be a quiet withdrawal without defamation of character on either side—which is what I want, for the procedure is common enough in business management and not attended by the resentment and sentiment that University changes in administration usually bring out." W. Trelease to W. Farlow, St. Louis, Feb. 16, 1912 (Farlow Library and Herbarium, Harvard University, Farlow papers).
32. "Hunting orchids in the Andes for St. Louis has its trials," *St. Louis Post-Dispatch*, Aug. 26, 1923, pp. 7, 14; "Brief biographies, George H. Pring," *The Aquarium*, Aug. 1945, pp. 65–66; "George H. Pring retirement issue," *M.B.G. Bull.* 51(2): 1–12, 1963; Olivia Skinner, "The three loves of George Harvey Pring," *St. Louis Post-Dispatch*, Jan. 3, 1963; George H. Pring, "The Garden as laid out by Henry Shaw," *M.B.G. Bull.* 52(5): 1–12, 1964; Edgar Anderson, "Learning from the bees: G. H. Pring and water-lily breeding," *M.B.G. Bull.* 54(10): 8–10, 1966; and "George H. Pring 1885–1974," *M.B.G. Bull.* 63(5): 1–2, 1974.
 33. "Tropical Life friend, no. 315, Dr. George T. Moore," *Tropical Life*, Sep. 1931, pp. 170–171; [Edgar] A[nderson], "Dr. George T. Moore, Director 1913–1953," *M.B.G. Bull.* 44: 141–142, 1956; and Carroll W. Dodge, "George Thomas Moore (1871–1956)," *Amer. Philos. Soc. Yearbook 1957*: 145–148, 1958.
 34. Board of Trustees Minutes, Mar. 13, 1912 (M.B.G. archives).
 35. Board of Trustees Minutes, Jan. 13, 1915 (M.B.G. archives).
 36. Board of Trustees Minutes, Feb. 13, 1918; Oct. 17, 1928 (M.B.G. archives).
 37. *Missouri Botanical Garden Illustrated* Board of Trustees of the Missouri Botanical Garden, [St. Louis] n.d. [ca. 1926], [56 pp.], folding map; and George T. Moore, "Thirty eighth annual report of the Director," *M.B.G. Bull.* 14(1): 1–22, 1927.
 38. "Young St. Louisian writes book on 1400 flowers of Missouri," *St. Louis Globe-Democrat*, Apr. 22, 1940; Cora Steyermark, *Behind the Scenes*, Missouri Botanical Garden, St. Louis, 1984, 158 pp; George Yatskievych & Luther J. Raechal, "In memoriam—Julian Alfred Steyermark, 1909–1988," *M.B.G. Bull.* 77(1): 5, 1989; Scott A. Mori & Brian M. Boom, "In memoriam—Julian A. Steyermark (1909–1988)," *Bull. Torrey Bot. Club* 116: 75–76, 1989; and [Julian Steyermark], "Steyermark Recollections," *Annals M.B.G.* 76: 627–651, 1989.
 39. Board of Trustees' Minutes, Mar. 17, 1926 (M.B.G. archives); and John D. Dwyer, "The history of plant collecting in Panama," in William G. D'Arcy & Mireya D. Correo A. (editors), *The Botany and Natural History of Panama: La Botanica e Historia Natural de Panama*, Monogr. Syst. Bot. Missouri Bot. Gard. 10: 179–183, 1985.
 40. Marilyn M. LeDoux, "Missouri Botanical Garden and its orchid collection," *Amer. Orchid Soc. Bull.* 58: 553–558, 1989; and Marilyn M. LeDoux, "Orchids through the years at the Missouri Botanical Garden," *Amer. Orchid Soc. Bull.* 58: 696–702, 1989.
 41. "Smoke to cost city at least part of Shaw's Garden," *St. Louis Post-Dispatch*, Feb. 21, 1923; Board of Trustees' Minutes, Mar. 21, 1923; Feb. 18, 1925 (M.B.G. archives); "When 'Old Sol' smiles or ducks under the clouds it is recorded at Shaw's Garden," *St. Louis Globe-Democrat Sunday Magazine*, Aug. 17, 1930; and Board of Trustees' Minutes, June 5, 1940 (M.B.G. archives).
 42. Board of Trustees' Minutes, Jan. 18, 1933 (M.B.G. archives).
 43. *M.B.G. Bull.* 44: 142, 1956.
 44. "Men of science in St. Louis, world famed botanist seeks clue to civilization's origin of corn," *St. Louis Post-Dispatch*, Feb. 8, 1948; Hugh Cutler, "Plants, man, life and Edgar Anderson," *M.B.G. Bull.* 57(5): 305, 1969; and John J. Finan, "Edgar Anderson 1897–1969," *Annals M.B.G.* 59: 325–345, 1972.
 45. Charles B. Heiser, Jr., "Student days with Edgar Anderson, or how I came to study sunflowers," *Annals M.B.G.* 59: 362–372; G. Ledyard Stebbins, "Edgar Anderson: recollections of a long friendship," *Annals M.B.G.* 59: 373–379; and interviews with William L. Brown, M. Donald Duvick, and G. Ledyard Stebbins, 1989 (tapes in M.B.G. archives).
 46. Interview with Hugh Cutler, 1988 (tape in M.B.G. archives).
 47. Interview with Rolla and Alice Tryon, 1989 (tape in M.B.G. archives).
 48. "Frits Went, California botanist, named Shaw's Garden director," *St. Louis Post-Dispatch*, May 18, 1958; transcripts from Went's diaries of the period and an interview of 1988 are on file in the M.B.G. archives.
 49. "The Climatron opens to the public," *M.B.G. Bull.* 48: 131–133, 1960; "And suddenly last summer," *Progressive Architecture*, Apr. 1961, pp. 174–178; George McCue, "The Climatron as architecture," *St. Louis Post-Dispatch*, Apr. 30, 1961, p. 5B; "The Climatron," *A[mer.] I[nstitute] [of] A[rchitects] Journal*, May 1961, pp. 27–32; Judith Jenkins, "A greater Shaw's Garden, Director Went envisions many future innovations," *St. Louis Globe-Democrat*, Nov. 24, 1962; and Robert Dingwall & Barbara Lawton, "The Climatron, Missouri Botanical Garden's space age greenhouse," *M.B.G. Bull.* 58(4): 12–21, 1970.
 50. "Program of music at Shaw's Garden," *St. Louis Post-Dispatch*, Sep. 23, 1959; "Where to put a cultural center," *St. Louis Post-Dispatch*, Jan. 8, 1963; "Downtown gets preference for culture center," *St. Louis Post-Dispatch*, Jan. 20, 1963; and "The cultural center reports," *St. Louis Post-Dispatch*, Jan. 27, 1963.
 51. Frits W. Went, "Missouri Botanical Garden, report of the director for 1962," *M.B.G. Bull.* 51(3): 1–

- 8, 1963; Frits Went, diary Apr. 1, 1963 and other diary entries (M.B.G. archives).
52. Edgar Anderson, "David M. Gates, the new director," *M.B.G. Bull.* 53(9): 1-7, 1965; Robert W. Stock, "Saving the world, the ecologist's way," *New York Times Magazine*, Oct. 5, 1969; and Gates interview 1988 (M.B.G. archives).
53. Mark Paddock, "Foreword," *M.B.G. Bull.* 57(1): 1, 1969; and Mark Paddock, "Annual report — 1969, a significant decade," *M.B.G. Bull.* 58(2): 2-4, 1970.
54. Thomas B. Croat, "The Missouri Botanical Garden in Panama," *M.B.G. Bull.* 60(1): 19-22, 1972.
55. Paddock 1969; and "The John S. Lehmann Building, a new era for the Missouri Botanical Garden," *M.B.G. Bull.* 60(3): 6-12, 1972.
56. David Gates, "Welcome to Dr. Raven from Dr. Gates," *M.B.G. Bull.* 59(5): 3-5, 1971; Barbara Perry Lawton, "New director of Missouri Botanical Garden," *M.B.G. Bull.* 59(5): 6-9, 1971; and Peter Raven, "From the director," *M.B.G. Bull.* 61(6): 1-3, 1972.
57. "John S. Lehmann Building, ready to meet the future," *M.B.G. Bull.* 75(1): 3-4, 1987.
58. William Barnaby Faherty, S.J., "The Missouri Botanical Garden through 125 years," *Gateway Heritage* 5(1): 10-19, 1984; Peter H. Raven, "The Missouri Botanical Garden in the world's service," *Gateway Heritage* 5(1): 40-48; *The Unseen Garden, Research at the Missouri Botanical Garden*, Missouri Botanical Garden, St. Louis, 1987, 44 pp.; and interviews with Tamra Raven, 1988 and Peter Raven 1989 (tapes in M.B.G. archives).
59. Lytton Strachey, *Eminent Victorians*, G. P. Putnam's Sons, New York, 1928, p. v.